



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Scott Levine; Michael Zasadzinski	Project Number S1512
Project Title Brass Instruments & Artificial Lips	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our main project goal was to find out how different variations of brass horns and mouthpieces affect the sound ultimately produced by a brass instrument.</p> <p>Methods/Materials 5 Different mouthpieces, which have different attributes. 3 Different "Low Brass" horns: 1) Kanstul Silver Baritone, 2) Horn Conn Brass Baritone Horn, 3) Conn Director 18H Trombone A Wooden, hermetically sealed, box, containing artificial lips made out of latex tubes filled primarily with water. Procedure: 1.To determine the frequency of the mouthpiece as played by the lips, we created a box containing Artificial Lips (See display). Copper tubing is inserted to the back and is connected to an air supply via sturdy tubing. 2.Compressed air travels into the box, which is pressurized, and vibrates the latex tubing against the mouthpiece, creating a buzzing sound. 3.Frequencies and pitches of four different mouthpieces are recorded using computer equipment and a Korg Orchestral Tuner.</p> <p>Results --Our data shows no apparent correlation between mass and frequency. There is a fairly significant correlation between rim size and frequency, as shown by the graph. This agrees with the widely held belief that rim mass plays a significant factor in the ability to play in the high register. --There seems to be a slight correlation between outer cup diameter and frequency, being that a smaller outer cup size apparently means a higher frequency. --There is an apparent direct correlation between inner cup size and frequency, being that a smaller inner cup diameter (diameter of interior cup at the top) and frequency.</p> <p>Conclusions/Discussion Our conclusion is that the size of the rim directly determines the frequency (pitch) produced by a mouthpiece, the pressure of air does not affect the pitch, and mass does not necessarily affect the pitch emitted from a mouthpiece.</p>	
Summary Statement How do variations of brass horns and mouthpieces affect the sound ultimately produced by a brass instrument?	
Help Received Used lab equipment at UCSB (compressed air); carpenter helped with the building of the box	